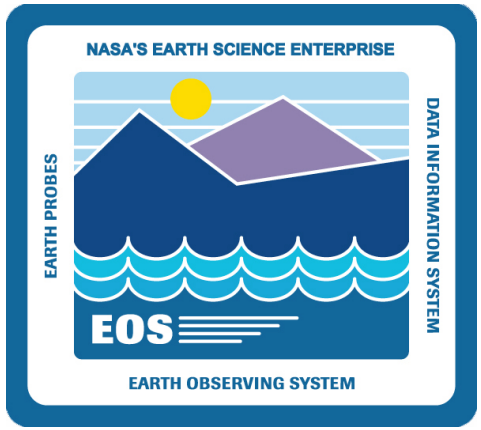


PROBLEM MANAGEMENT

EMD Training

Overview of Lesson

- Introduction
- Writing a Trouble Ticket (TT)
- Documenting Changes
- Problem Management
- Practical Exercises
  - Writing a Trouble Ticket
  - Documenting TT Changes
  - Documenting Failures and Severity

Objectives

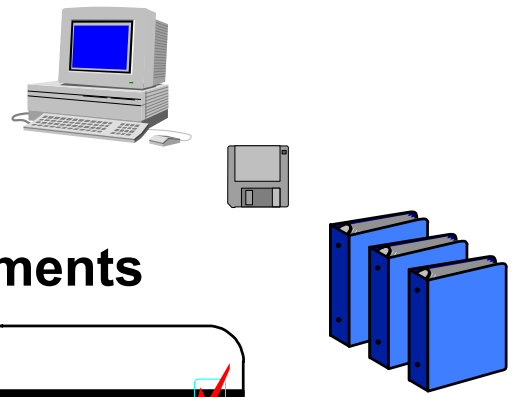
- **OVERALL:**
  - **Develop proficiency in trouble ticketing and problem resolution procedures**
- **SPECIFIC:**
  - **Submit a trouble ticket (TT) with enough information to enable correct assignment of severity**
  - **Make changes to an existing TT**
  - **Describe the steps in the routine problem resolution process**
- **STANDARD:**
  - **Mission Operation Procedures for the EMD Project - 611-EMD-001**

Importance

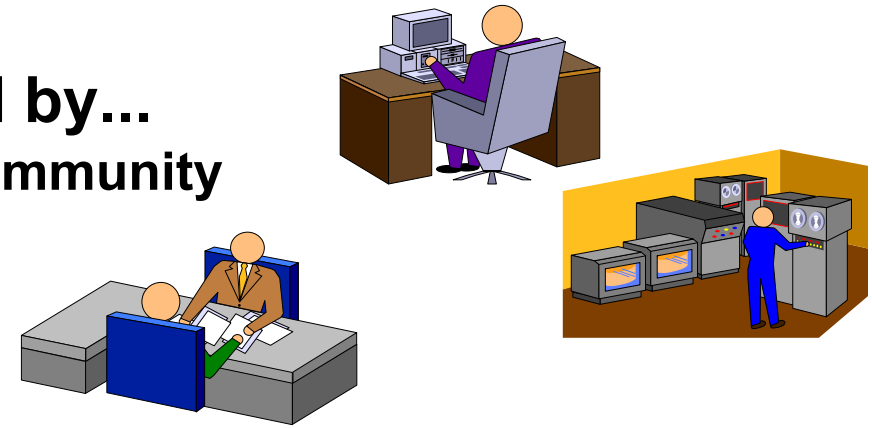
- All internal users of ECS are affected
- If a problem occurs with ECS hardware, software, documentation, or procedures, it is necessary to apply problem management tools and procedures
- Clear and complete inputs to the DAAC Support Help Desk determine correct assignment of severity to ensure effective support in problem resolution

Writing a Trouble Ticket (TT)

- **Electronic document for:**
  - **Reporting/recording problems**
  - **Recording an idea for a system enhancement**
- **Problems affect the following ECS components:**
  - **hardware**
  - **software**
  - **technical documents**
  - **procedures**



Writing a Trouble Ticket (Cont.)



- TTs may be submitted by...
  - users in the science community
  - ECS operators/staff
  - ECS developers

- Trouble Ticket states:
  - new
  - assigned
  - solution proposed
  - implement solution
  - solution implemented
  - closed
  - forwarded
  - work around
  - not repeatable

Writing a Trouble Ticket (Cont.)

- **If a configuration change is required, a Configuration Change Request (CCR) is prepared.**
  - **provides documentation for the configuration management process**
  - **a TT leads to a CCR only when a configuration change is proposed (e.g., changing a baselined system Configuration Item)**

Writing a Trouble Ticket (Cont.)

- **ECS Trouble Ticket System provides a consistent means of…**
  - **reporting ECS problems**
  - **classifying problems**
  - **tracking the occurrence and resolution of problems**

Writing a Trouble Ticket (Cont.)

- **Trouble Ticket System**
  - **managed by Remedy's Action Request System**
  - **provides Graphical User Interface (GUI)**
  - **provides a common entry format**
  - **stores TTs**
  - **retrieves TTs**
  - **transfers TTs between facilities**
  - **produces reports**
  - **provides e-mail interface (automatic notification)**
  - **provides application programming interface**
  - **provides summary information to SMC**
  - **defines TT "life cycle"**
  - **allows customized local escalation and action rules**

Writing a Trouble Ticket (Cont.)

- **Trouble Ticket System - methods of submitting TTs or checking TT status:**
  - **Remedy (Action Request System)**
  - **custom hypertext markup language (HTML) documents**
  - **text e-mail template**
  - **contacting a User Services representative at one of the DAACs**
    - » **by telephone**
    - » **in person**

Writing a Trouble Ticket (Cont.)

- **User Services - Contact Log**
  - **separate Remedy form (GUI) for recording user contacts**
  - **clicking a button transfers data from the contact log to the appropriate fields on a trouble ticket form**

Writing a Trouble Ticket (Cont.)

- **Writing/Submitting Trouble Tickets**
  - **external users**
    - » **HTML documents**
    - » **e-mail template**
    - » **contacting User Services**
  - **internal operators and users**
    - » **Remedy Action Request System**

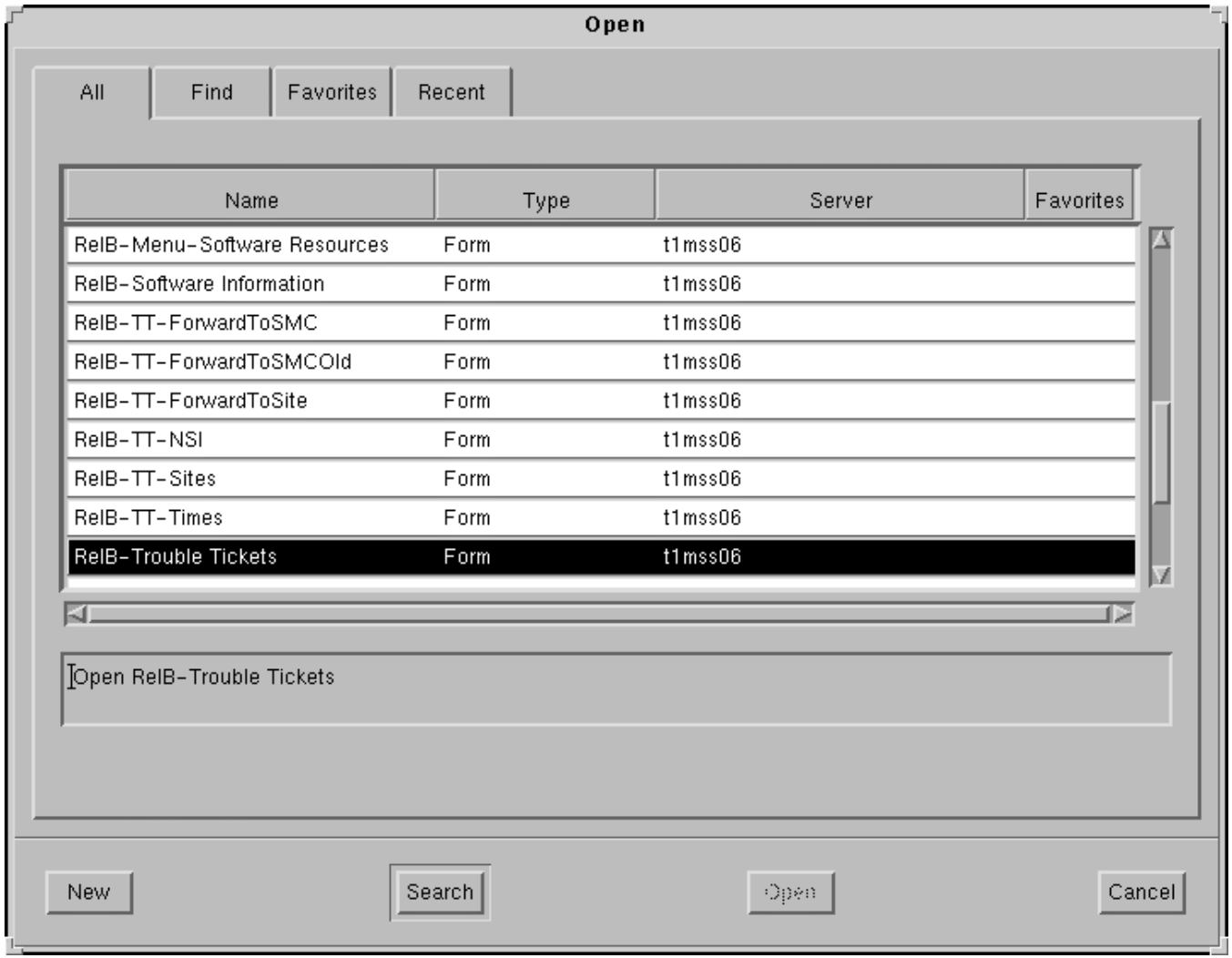
Writing a Trouble Ticket (Cont.)

- TTs are handled electronically
  - common distributed-access database system
  - Remedy is the database tool
- Supporting documentation must be handled separately
  - not possible to attach a file in Remedy
  - via e-mail to the TT system administrator
  - sending/giving it to the TT system administrator
- Configuration Management Administrator (CMA) at each site serves as TT system administrator

Writing a Trouble Ticket (Cont.): Procedure

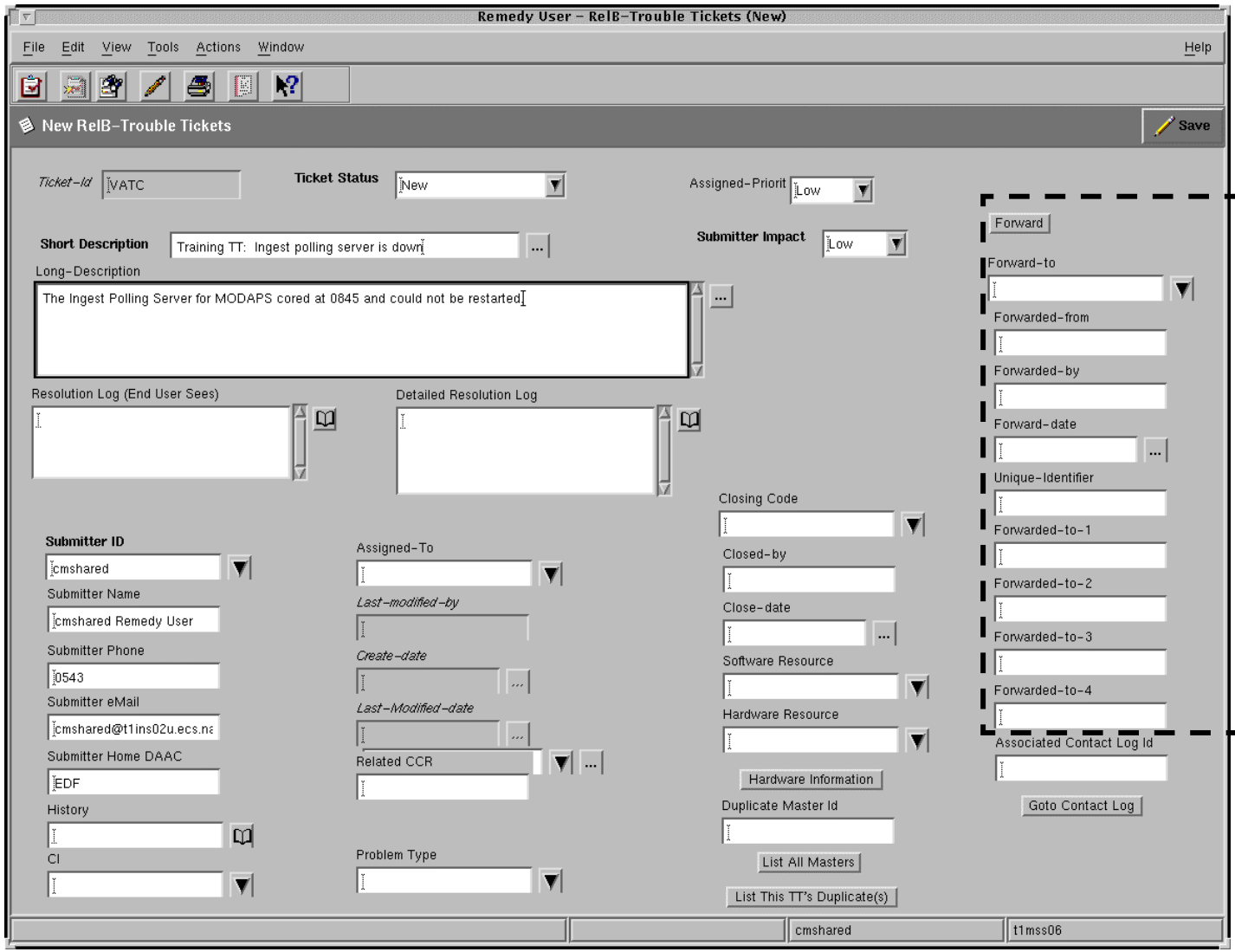
- Launch Remedy User Tool
  - Follow procedure to access Remedy
- Log in if first-time user
- Open RelB-Trouble Tickets Form
  - File menu
  - Open
  - Click “New” Button

Writing a Trouble Ticket (Cont.): "Open" Window



Note: Not all choices may appear on your window, depending on your assigned authorizations.

Writing a Trouble Ticket (Cont.): Release B Trouble Tickets Form



These entries may not appear on your window, depending on your assigned authorizations.

Writing a Trouble Ticket (Cont.): Procedure

- Type a short description of the problem, trying to capture the essence of the problem in a few words
  - Short Description field
- Fill in Submitter ID
  - Submitter ID field
  - Use pick-list
- Select Submitter Impact (Perceived Problem Severity)
  - High, Medium or Low
  - Required
  - Low is default

Writing a Trouble Ticket (Cont.)
Procedure (Cont.)

- Fill in "optional" data (some entries mandatory to support effective problem resolution):
  - Long Description
    - » 4060-character field for a full descriptive characterization; this is the place to put information on problem frequency, time and people required for recovery/workaround, impact on daily/weekly quotas, and how soon the fix is needed
  - Key Words
    - » 255-character field; enter mode and release (e.g., OPS:6B)
  - Software Resource
  - Hardware Resource
- Verify data
- Submit the TT
  - click on the Save button (or select Save from the Actions menu)
  - confirmation message appears at bottom of window
  - Remedy also sends confirmation by e-mail

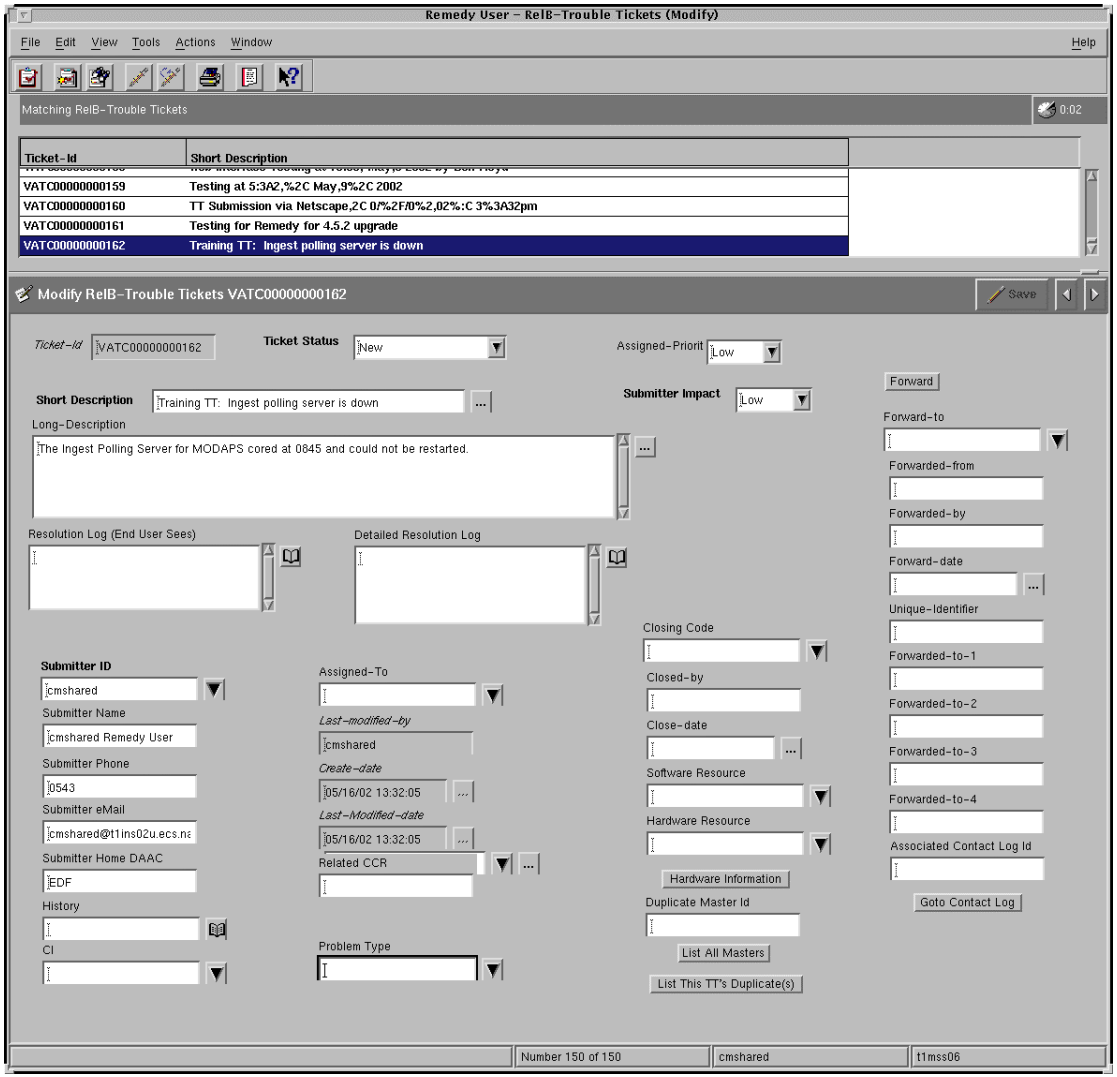
Writing a Trouble Ticket (Cont.) Procedure (Cont.)

- **Exit from the Remedy Action Request System**
  - **Select "Exit" from the File menu**
- **Send backup information/documentation to the TT database administrator**
  - **send e-mail cover message**
    - » **identify TT number**
    - » **provide Submitter ID**
    - » **include relevant information concerning attachments**

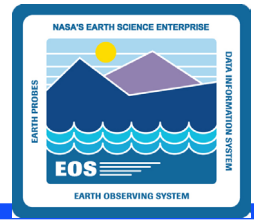
Documenting Changes

- **Trouble tickets are modified at various stages of problem resolution, for example:**
  - **assignment to a technician for problem resolution**
  - **resolution log entries**
  - **changes of status**
  - **forwarding to another site**
- **Access privileges**
  - **controlled by the database administrator**
  - **determine which TT fields an operator/user may modify**

Documenting Changes (Cont.): Modify RelB-TroubleTickets Window



Documenting Changes (Cont.): Reviewing and Modifying Open TTs



- **Launch Remedy User Tool**
  - Follow procedure to access Remedy
- **Open Search RelB-TroubleTickets window**
  - File menu
  - Open
  - Click “Search” Button
- **Enter data to define search**
  - Case-sensitive data in fields
  - “Advanced” search using Boolean expression
  - Enter no data to yield list of all tickets in database

Documenting Changes (Cont.): Reviewing and Modifying Open TTs

- List TTs and Display Modify Rel-B TroubleTickets window
  - Click “Search” button or select “Search” from the Actions menu
- Review/Modify TT fields
- If forwarding the TT:
  - set Ticket Status at Forwarded
  - select (from pick-list) the center to receive the TT
  - click on the Forward button

Documenting Changes (Cont.): Reviewing and Modifying Open TTs

- **Save changes**
  - **click on the Save button**
- **Exit from the Remedy Action Request System**
  - **select “Exit” from the File menu**

Problem Management

- **Control Board Reviews**
  - **EMD Problem Management is administered through system-level and site-level control board reviews**
  - **Control boards oversee the analysis, recommendations, and actions taken to resolve ECS system/site problems concerning hardware, software, documentation, and procedures**
  - **Operations (OPS) Deployment and the site-level organizations resolve routine maintenance issues at the system-level and site-level, respectively, using the trouble ticket system for tracking system problems**

Problem Management (Cont.)

- **Control Board Reviews (Cont.)**
  - **TTs may evolve into Non Conformance Reports (NCR), as required, which may then be utilized to generate Configuration Change Requests (CCR) to effect changes to the approved baseline**
  - **To ensure controlled change, NCRs are tracked using the DDTS in the ECS Development Facility (EDF) and CCRs are tracked manually by Systems Engineering**

Problem Management (Cont.)

- **The trouble ticket process is the first vehicle used to record and report problems with the operational system**
  - **TTs which require changes to the system level baseline, are forwarded to the SMC, where they are reviewed and translated into NCRs**
  - **TTs and CCRs that are repaired locally, and result in site-unique extensions to the system level baseline, are forwarded to the SMC for tracking across the ECS/EMD baseline**
  - **The Problem Review Board (PRB) designee is responsible for tracking TTs after they have been received from the sites, and for propagating system problem resolutions for site visibility**
  - **CMAs also support the activities of the local review board, including generating status reports, and implementing resolutions, instructions, and changes**

Problem Management (Cont.)

- Trouble ticket process (Cont.)
  - User Services Representatives monitor trouble tickets to notify users concerning problem resolution and status
  - Maintenance engineers at respective levels record all activities in the trouble ticket
    - » This information can be used to determine critical maintenance concerns related to frequency of occurrence, criticality level, and the volume of problems experienced
    - » The maintainability analysis guides critical changes, volume and type of support components to be utilized, and focuses further development efforts

Problem Management (Cont.)

- **TT submission triggers an internal review by the site's review board**
  - **Primary objectives of the internal review:**
    - » **Quickly identify and correct problems that fall within the site's capability to maintain, review and validate the priority of the problem**
    - » **Elevate to the system level those problems that either exceed their capability to repair, or that require a change to the system level baseline**

Problem Management (Cont.)

- Problems passed from the sites to the ECS system level, are passed by transferring the trouble ticket from the local trouble ticket system to the SMC trouble ticket system
- Here they are reviewed by the EMD Problem Review Board (PRB), which hosts daily teleconferences, known as the PRB Telecon
- PRB performs a preliminary review of each trouble ticket
  - Confirms the severity assigned by the site
  - Checks the completeness of information and data relevant to the problem
  - Determines whether the TT requires a change to the system-level operational baseline

Problem Management (Cont.)

- The PRB has the authority to direct resolutions to trouble ticket problems that do not change (or in any way affect) the ECS/EMD operational baseline and baseline documentation
  - An NCR is required when a Technical Investigation (TI) determines that the operational baseline must be changed in order to correct the problem identified in the trouble ticket
- The PRB is not a voting board
  - Membership is appointed for the purpose of providing timely, direct technical support to the Chair, who has the decision-making responsibility and authority

Problem Management (Cont.)

- **Permanent membership of the PRB:**
  - **Chair: Problem Management Lead or designee**
  - **Each DAAC: one member representative**
  - **Quality Assurance: one member representative**
  - **ESDIS M&O: one member representative**

Problem Management (Cont.)

- **Roles and responsibilities of PRB Telecon participants:**
  - **Follow a nominal agenda that includes the following discussions:**
    - **New trouble tickets**
    - **Deferred trouble tickets**
    - **Aging high trouble tickets**
    - **Review of all Severity 1 (Sev 1) NCRs (OPS and RelB)**
    - **Review of new OPS NCRs**
    - **Review NCRs in the Verified State of DDTS**
  - **Review severity of each NCR**
  - **Convert any TTs that identify a system non-conformance and have the appropriate information into an NCR**

Problem Management (Cont.)

- NCRs that involve operational baseline changes that are within the scope of the contract are evaluated by the Science Development (SCDV) CCB
  - Changes that are within the scope of the contract are Class II changes as described in 110-EMD-001, Configuration Management Plan for the EMD Project
- The Science Development (SCDV) CCB has the authority and responsibility to approve Class II changes to the operational baseline

Problem Management (Cont.)

- **Permanent membership of the SCDV CCB:**
  - **Chair: EMD Systems Engineering and Integration Team (SEIT) designee**
  - **Members of the EMD SEIT and designees**
  - **Each DAAC: one representative**

Problem Management (Cont.)

- **Roles and responsibilities of the SCDV CCB:**
  - **Review, approve and schedule; review and backlog; or reject each NCR's proposed resolution, or cost and schedule input from the Responsible Engineer (RE)**
  - **Approve the schedule for the deployment of configuration changes in the form of a 'drop' to the SMC**
  - **Approve the content of each block**
  - **Manage and adjust the schedule and contents of each block in accordance with program priorities and the progress of NCR work-off**
  - **Review the status of all backlogged NCRs on a periodic basis; schedule NCRs for a future block as appropriate**
  - **Collect and report on NCR statistics**

Problem Management (Cont.)

- **Assessing/Categorizing Problem Severity**
  - **Remedy Trouble Ticket application provides fields for rating the "Submitter Impact" and "Assigned-Priority" of a problem**
    - » **It is intended that the submitter of a trouble ticket use the Assigned Impact field to rate the severity of the problem**
    - » **The Assigned-Priority rating may be used at the DAAC for those problems that will be handled locally, but is typically reserved for use by DAAC Support Help Desk staff in assigning priorities for handling problems referred to them**
  - **The DAAC Support Help Desk reviews the information provided by the DAAC to determine if the problem has been described in enough detail to warrant the recommended severity**
    - » **If there is insufficient information, the DAAC submitter or point of contact is contacted for additional input**

Problem Management (Cont.)

- **Assessing/Categorizing Problem Severity (Cont.)**
  - **In determining severity of the problem, the DAAC Support Help Desk considers the following factors:**
    - » **Impact on the ability to ingest, process or distribute satellite data**
    - » **Frequency of occurrence**
    - » **Availability of an adequate work-around**
  - **The priority categories are approximately equivalent to categories specified in the Performance Assurance Requirements document**
    - » **EOS Performance Assurance Requirements for ECS, Goddard Space Flight Center (GSFC) 420 05 03**

Problem Management: Priority/Severity

As Documented in NASA 420-05-03	As Used/Interpreted by the EMD Project
Category 1: System/Service cannot perform critical function or imposes major safety hazard. (Priority 1) Presents an immediate impact to development, operations, services, or data processing functions; imposes major safety hazard to personnel, systems, or space mission resources; or results in loss of one or more essential mission objectives.	**HIGH (Severity 1)**: An NCR which causes: – Inability to perform a mission-critical function (i.e., Ingest/Pre-Processing/Archiving of Science Data, Planned Processing, Browse/Order/Distribute); – Performance of a mission-critical function to be so degraded that production minimum goals cannot be achieved; – A mission-critical function to be performed improperly, resulting in permanent loss of data; ***and*** for which no workaround exists ***or*** for which no workaround can be accommodated by DAAC operators given a detailed workaround procedure is documented but the procedure is inadequate based upon the complexity of the procedure, the abilities of an adequately trained and experienced operator, or both.
Category 2: System/Service substantially impaired. (Priority 2) Substantially impacts development, operations, services, or data processing functions; fails to operate within critical performance specifications; or cannot effectively or efficiently fulfill baseline requirements.	**MEDIUM (Severity 2)**: An NCR with the consequence that: – The performance of a mission-critical function is degraded and may prevent achieving production minimum goals; – A mission-critical function can be only partially performed, or performs improperly, resulting in temporary loss of data or incorrect data results; – A situation (actually or potentially) severly compromises ECS mission readiness or operational integrity; – A condition exists to produce a severely degraded mission-critical function, but a workaround will allow operations to continue temporarily without permanent loss of data or severely impaired performance/workload/schedules.
Category 3: System/Service slightly impaired. (Priority 3) Causes minor or no substantial impact to development, operations, services, or data processing functions. Support may be degraded, but mission can still be accomplished.	**Severity 3**: An NCR with the consequence that: – A non-critical mission function (e.g., Advertising) cannot be performed, or yields incorrect results; – Unexpected events occur which can be corrected using normal operational procedures with minimal impacts to performance/workloads/schedules – A condition exists to produce a degraded mission-critical function, but a workaround will allow operations to continue indefinitely without severely impaired performance/workload/schedules.
	Severity 4: Improvement (Nuisance; e.g., a typo).
	Severity 5: Enhancement (Identified for next release).